

Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE
General Certificate of Education
Advanced Subsidiary/Advanced



CYD-BWYLLGOR ADDYSG CYMRU
Tystysgrif Addysg Gyffredinol
Uwch Gyfrannol/Uwch

311/01

BIOLOGY

MODULE BI1

A.M. TUESDAY, 10 January 2006

(1 hour 30 minutes)

For Examiner's Use Only

Total Marks	
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INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

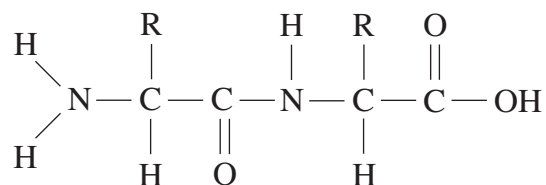
The quality of written communication will affect the awarding of marks.

No certificate will be awarded to a candidate detected in any unfair practice during the examination.

1. (a) What term is used for similar cells which are grouped together within an organism? [1]
.....
- (b) Name the two purine bases in DNA. [1]
.....
- (c) Name the types of fats which have --CH=CH-- in the fatty acid part of the molecule. [1]
.....
- (d) Explain what is meant by an *immobilised* enzyme. [1]
.....
- (e) Name **one** medical use of a biosensor. [1]
.....

(Total 5 marks)

2. The diagram shows a molecule which can be split by an enzyme to produce two amino acids.



- (a) Name the molecule. [1]

.....

- (b) (i) Draw an arrow on the diagram to indicate the bond which is broken by the enzyme. [1]

- (ii) Name the type of reaction which causes the bond to break. [1]

.....

- (c) The two amino acids formed are not identical. How would their structures differ? [1]

.....

- (d) Approximately how many different amino acids are found in proteins?
Draw a circle around your choice. [1]

10 20 30 40 50

- (e) (i) Name the most common type of secondary structure found in proteins. [1]

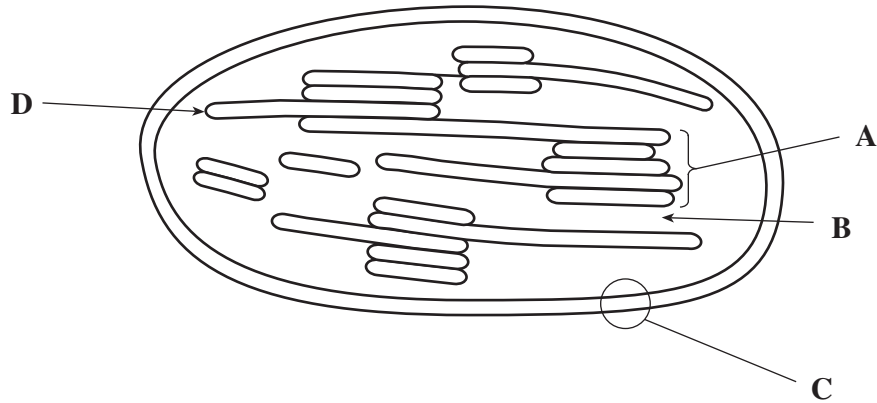
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- (ii) How is this structure maintained? [1]

.....

(Total 7 marks)

3. The diagram below shows the structure of a chloroplast.



- (a) Name the structures labelled:

[4]

A

B

C

D

- (b) One organic compound which is found in the internal membranes of the chloroplast, never occurs in any other plant or animal organelle. Name this compound. [1]

.....

- (c) Chloroplasts are said to be self replicating.
Name **one** structure (not shown in the diagram) which would be involved in the production of new chloroplasts. [1]

.....

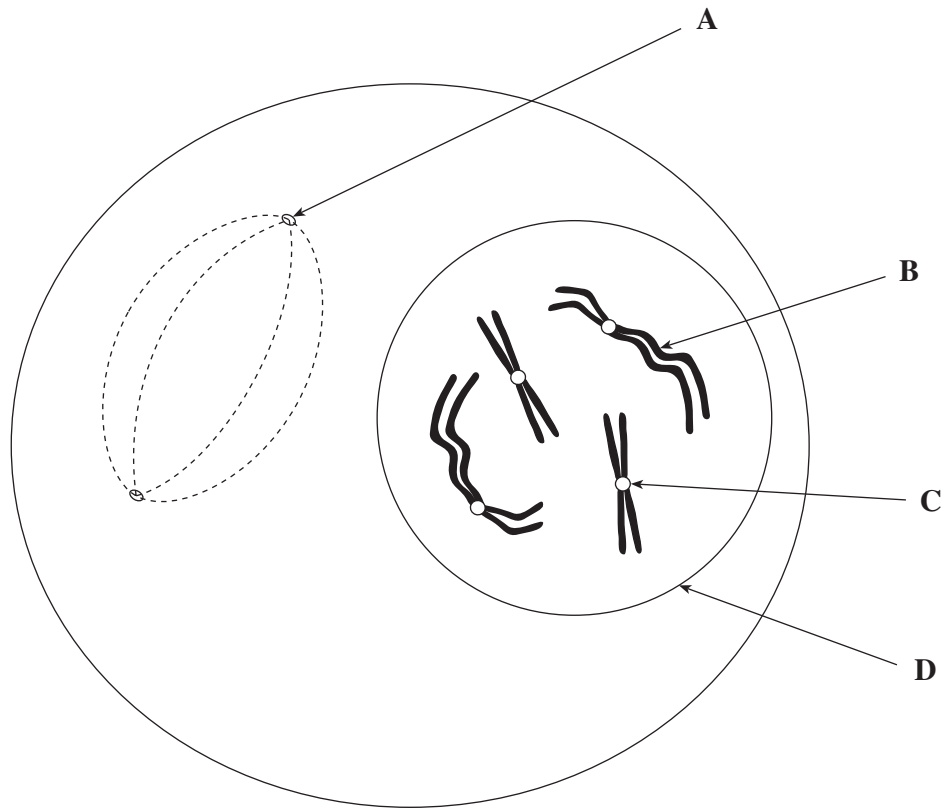
(Total 6 marks)

4. Each statement in the table below applies to **one or more** of the three ways in which materials in solution can enter a cell across the plasma membrane.
Complete the table by ticking the appropriate boxes.

	<i>Diffusion</i>	<i>Facilitated Diffusion</i>	<i>Active Transport</i>
Substance dissolves in lipid part of membrane.			
Will not take place in presence of cyanide.			
Movement involves membrane proteins.			
Does not require cell energy.			
Rate is proportional to concentration gradient across membrane.			
Due to random movement of molecules in external solution.			
At very high external concentrations the rate of movement is constant.			
Membrane proteins act as pumps.			

(Total 11 marks)

5. The diagram shows a stage in cell division.



(a) Name the structures labelled:

[4]

A

B

C

D

(b) Name the phase shown.

[1]

.....

(c) (i) Name the type of division shown.

[1]

.....

(ii) Give **one** reason for your answer to (c)(i).

[1]

.....

(d) State **one** biological function of this type of division.

[1]

.....

- (e) The diagram shows an early stage in this phase. A diagram drawn at the **end** of this phase would show several changes.
Give **three** of these changes. [3]

1.

.....

2.

.....

3.

.....

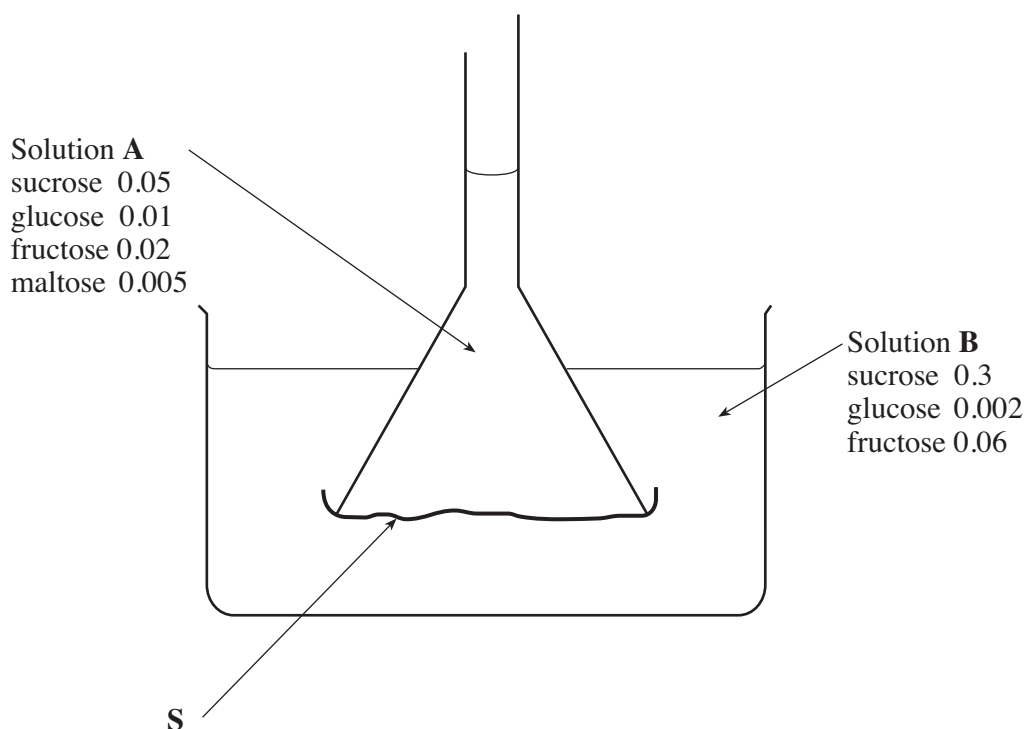
- (f) Is the cell shown an animal cell or a cell from a higher plant?
Use your knowledge of cell division to explain your choice. [2]

.....

.....

(Total 13 marks)

6. The diagram shows an inverted funnel which contains a mixture of sugars in solution (**A**) and is clamped in a beaker containing another sugar solution (**B**). The concentrations of sugars in mol dm^{-3} are shown in the diagram.



The funnel opening is covered by a selectively (partially) permeable membrane (**S**).
The membrane is permeable to monosaccharides and water, but not to disaccharides.

- (a) (i) Which of the solutions would have the higher (less negative) water potential? [1]

.....

- (ii) Explain your choice. [1]

.....

.....

- (b) After a time interval, would the level of liquid in the stem of the funnel have risen,
stayed in the same place,
or fallen?

Underline your choice and explain your reason.

[2]

.....
.....

- (c) Name a solute which would

[2]

- (i) diffuse into solution **A**,

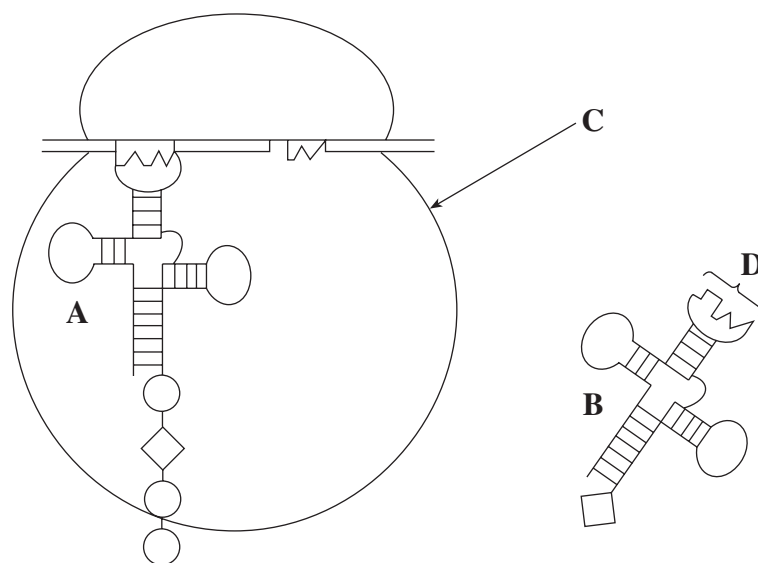
.....

- (ii) diffuse out of solution **A**.

.....

(Total 6 marks)

7. The diagram represents a stage in the synthesis of a polypeptide chain.



(a) Name

(i) the organelle labelled **C**,

[1]

.....

(ii) the structure labelled **D**,

[1]

.....

(iii) the **three** types of RNA involved.

[2]

.....

.....

.....

(b) The process shown arranges the correct sequence of amino acids in the peptide.

(i) Name this process.

[1]

.....

(ii) Explain what ensures that the correct amino acid is added.

[3]

.....

.....

.....

.....

.....

.....

(c) After the stage shown, explain what happens to **A** and **B**.

[3]

.....

.....

.....

.....

.....

(d) It is important that this whole process is carried out correctly.
Explain why.

[1]

.....

.....

.....

(Total 12 marks)

Any diagrams included in your answer must be fully annotated.

(ii) Using a graph, explain the effect of a fixed concentration of each type of inhibitor on the relationship between substrate concentration and the rate of an enzyme catalysed reaction. Assume that inhibitor concentration is lower than enzyme concentration. [5]
(Graph paper is not required)

(ii) genetic fingerprinting. [5]

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(311/01)

This image shows a full page of white paper with horizontal dashed lines, typical of primary school handwriting practice paper. The lines are evenly spaced and run across the entire width of the page. There are no margins, text, or other markings present.